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ABSTRACT

A study was conducted of the use of computers in business education programs in four-year publicly funded colleges and universities in Louisiana. The study was conducted to provide business educators with a practical reference on computer uses in postsecondary business education programs and to determine if the schools have long-range plans and means of implementing those plans for computer use. A 50-item questionnaire was developed and mailed to all business education department heads and faculty at four-year state-supported colleges and universities, with a response rate of 79 percent (56 questionnaires). Some of the findings of the study were the following: (1) to be computer literate, one must have a knowledge of computer terminology and concepts and have the ability to use computer programs; (2) adding or restructuring courses seemed to be the predominant means of incorporating computer instruction into business education curricula; (3) applications, tutorials, and drill/practice software packages were most often used; (4) vendors supplied equipment and materials but were used only nominally for computer instruction, placement, and follow-up; (5) graduates obtained employment based on computer skills; (6) certificates for computer training had little importance; and (7) administrative support of computer instruction is very important. Recommendations were made for increased planning and evaluation of computer instruction in business education. (67 references) (KC)

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Vocational Education Research

IMPLICATIONS AND RECOMMENDATIONS FOR INSTRUCTION IN BUSINESS EDUCATION CLASSES RELATIVE TO TYPES OF COMPUTERS AND TYPES OF SOFTWARE USED IN LOUISIANA POST-SECONDARY BUSINESS EDUCATION PROGRAMS

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1988

LOUISIANA DEPARTMENT OF EDUCATION

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IMPLICATIONS AND RECOMMENDATIONS FOR INSTRUCTION IN BUSINESS EDUCATION CLASSES RELATIVE TO TYPES OF COMPUTERS AND TYPES OF SOFTWARE USED IN LOUISIANA POST-SECONDARY BUSINESS EDUCATION PROGRAMS

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FOREWORD

This report was designed to access the instructional methods in business education programs relative to types of computers and types of software used in four-year publicly funded colleges and universities in Louisiana. The study contains a description of what presently exists in post-secondary schools, what the long-range plans are, and what means exist for implementing the long-range plans. Chapter I relates the purpose of the study, the need for the study, and a review of related literature. Chapter II presents the methodology and procedures of the study. Chapter III discusses the findings of the study. Chapter IV summarizes the findings and offers implications of the study for business education programs. Conclusions and recommendations for further research, as well as recommendations for business education, are presented.

Wilmer S. Cody
Louisiana State Superintendent of Education

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Don R. Wood

Don R. Wood, Assistant Superintendent
Office of Vocational Education

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CHAPTER I

INTRODUCTION

One single event in 1969 impacted for all times the way our society functions. In that year Robert Noyce, co-founder of the Intel Corporation, and Ted Hoff of Intel co-invented the integrated circuit and microcomputer. Since then microcomputers have evolved rapidly and are recognized as powerful computing tools for business, industry, and education (Naisbett, 1982). This report looks at the use of computers in business education programs in four-year publicly funded colleges and universities in Louisiana. Chapter I, presents the purpose of the study, the need for the study, and a review of the related literature.

Purpose of the Study

The study has two primary purposes. The first is to provide business educators with a practical reference on computer uses in post-secondary business education programs in Louisiana. The second is to determine what presently exists in post-secondary schools regarding long-range plans, and what means exist for implementing the long-range plans. To that end, the following research questions address these and related purposes:

Research Question One. What are the dimensions of a working definition of computer literacy in business education?

Research Question Two. What evidence is there that business education programs are modifying their curricular and instructional computer offerings to meet the needs of business and industry?

Research Question Three. What are the strengths and weaknesses of computer software used in post-secondary business education programs?

Research Question Four. To what extent are computer vendors used as resources in business education computer instruction and in curriculum development?

Research Question Five. What provisions are made for retraining and updating staff in the business education programs including representatives from business, industry, labor, and the computer industry?

Research Question Six. What evidence is there that graduates of programs utilizing computer instruction are obtaining employment based on computer training?

Research Question Seven. To what extent do business education students receive certificates for completing work with computers, apart from diplomas? Are there problems with issuing such certificates?

Research Question Eight. What recommendations do educators make for the future uses of computers in business education?

Need for the Study

That computers are rapidly becoming more available in schools is well documented. A study by the Louisiana State Department of Education, Office of Research and Development (1984) reported in an annual survey of 844 public and nonpublic elementary and secondary schools that 81 percent of Louisiana schools were using computers as compared to 32 percent in 1982-1983. The number of computers almost tripled in one year. The Market Data Retrieval

Company conducted a study in 1982 which (Fiske, 1983) found that 50 percent of all high schools and 40 percent of all junior high schools had microprocessors.

Fuchs (1982) studied the predictions of 40 secondary school teachers in Missouri regarding the usefulness of computers and found that business faculty were the most enthusiastic and thought computers would become indispensable to their curriculum. They felt that business teachers have an obligation to make the curriculum relevant to the business world.

The National Education Association (NEA, 1983) surveyed 1,028 of its members in elementary and secondary public schools. Three areas of greatest need were identified by computer users: more software (36%), greater personal knowledge about computers (24%), and more hardware (18.7%). The survey also found that simply making computers available in the classroom would not necessarily increase computer literacy of students and would certainly not solve computer literacy problems automatically. The survey determined that only 13 percent of teachers surveyed had ever used computers, indicating that instructional computing was not widespread in 1983.

Fraser (1985), writing about human factors to consider in the implementation of computers in schools, reported that many will point to problems with hardware and software as reasons for moving slowly, or not at all, in the implementation of a computer component in a program. Fraser believed that often these were symptoms not so much of problems with the computer systems but of individuals' reluctance with respect to use of innovative technology.

It would appear from these early surveys that college business education programs may not be prepared to meet student needs with respect to computer literacy during the coming years. It is likely that students entering

college business education programs will have more computer experience than business faculty. Therefore, there is a need to know what is being done in the area of computer instruction in business education programs at the college level.

Review of Related Literature

This section reviews the literature as it relates to "definitions," "research," "computer instruction," and "state-wide efforts." Included publications addressing computer hardware and software uses in business education were in abundance; whereas, commentaries reporting state-wide uses of computer instruction were rare.

Definitions

Lantz (1984) identified the basic dimensions of computer literacy suggested by educators in Ohio as follows:

1. Understanding the role of the computer in society and knowledge of the social, economic, political, and technological implications of the computer.
2. Knowledge of the capabilities and limitations of the computer.
3. Keyboarding skills.
4. Knowledge of skills in the use of the computer as a tool (problem solver), including knowledge of fundamental terms/vocabulary (the emphasis is to teach "with" the computer, not "about" the computer).
5. Awareness of the programming process, particularly with respect to data entry and retrieval, and the capability to perform fundamental computations, word processing functions, graphics, and simulations.

6. Knowledge of careers and job opportunities and of trends related to the computer.

Lantz distinguished basic dimensions of computer literacy from extended dimensions such as knowledge of ethical and legal computer use considerations and familiarity with a programming language (BASIC or PASCAL) and operating system or an introductory understanding of UNIX operating system and C language as well as authoring languages (for example, PILOT).

Heath (1987) reported that "computer literacy is knowing what you need to know about computers in order to function in your environment." A cursory examination may lead one to conclude that the ability to "use" a computer is not in this definition. But Heath explains that knowing what can be expected of a computer merely provides one with the preliminary knowledge needed to investigate the computer functions one needs to learn to be able to function effectively. In other words, "function in your environment" means that one is able to perform the needed tasks.

In their report of teacher training efforts, Hobart, Octernaud, and Sytsma (1988) stated that almost everyone agrees that computer literacy includes the ability to use the most common software applications--word processing, spreadsheets, and databases. Many authors (Sutphin, 1987; Rahn, 1987; Roblyer and Castine, 1987) concur with this concept.

The National Task Force on Educational Technology (1986) recommended that schools sponsor pre-service and in-service training in which teachers learn to use technology both as an instructional and as a management tool. The Task Force issued a clear mandate that schools should prepare teachers with the necessary tools to "transform," as opposed to "reform," curriculums

to include applications of information technology. To carry out the Task Force mandate, teachers must be leaders in computer learning before they can be leaders in computer training.

Research

Several authors have compiled interesting research summaries. A broad view of computer instruction was presented by Ploeger (1984) in an extensive review of the literature. Based on a preliminary examination of over 1,200 articles and abstracts and a subsequent review of selected articles, this booklet presented the most important research published since 1979 in the field of computer instruction, including both computer-assisted and computer-managed instruction in elementary, secondary, and post-secondary education. A second collection was by Dellow and Poole (1985) in which the articles identified and discussed challenges facing community colleges as they attempt to implement new computer technology for instructional and administrative purposes.

Research findings on computer-designed instruction and testing at the college level were discussed in 13 papers from the first Regional Conference on University Teaching (Conference on University Teaching, 1986). Other researchers (Massey, 1987; Griswold, 1985; Fowler, 1983) studied the ways student attitudes affect the amount of learning they receive as a result of computer instruction.

Computer Instruction

A focused perspective on computer instruction may be gained by looking at how computers are being accommodated in instructional areas. There have been changes in many business education programs to include the use of computer instruction. In fact, computer instruction is transforming the teaching of economics and accounting courses (Trotman-Dickenson, 1986; Hurd, 1986; Read, 1986; Kincade, 1986; Fitzgerald, 1983; Gold and Pray, 1985; Barr, 1985; Miller, 1986; Post, 1985; Scheraga, 1986; Robinson, 1984).

Although most studies recommend an increase in computer instruction, some authors (Hiltebeital and Harmon, 1984) found that there was not a major emphasis on computers in accounting in their study of colleges and universities in Pennsylvania, particularly for reasons of insufficient time, lack of quality software, and cost of equipment. This trend was unusual, for other authors (Parmley and Parmley, 1986; D'Onofrio and Slama, 1983; Nash and England, 1986) reported efforts to increase computer instruction in accounting. The heavy use of accounting software, then, is largely a phenomenon of the last five years.

Zahniser, et. al. (1983) focused on the computer as an instructional tool for the benefit of students, and to some extent as an aid to staff through computer-managed instruction.

In keeping with the trend toward increased computer instruction, scores of authors have reported changes in the way business instructors teach. Much of the research (Gattiker, et. al., 1986; Berghel, 1986; Brum, 1986; Schulz, 1986; Schmidt and Stewart, 1983; Lindsay, 1983; Chisholm and Krishnakumar, 1981) centered on the effectiveness of the various teaching methods used to incorporate computer instruction into the curriculum. Other reports suggested ways of integrating computer instruction into the business

curriculum and ways to update the curriculum around computer instruction (Briggs, et. al., 1987; Cohen, 1987; Dalgaard and Lewis, 1985; Lloyd, et. al., 1984; Buck and Jackson, 1985; Moreby, 1985; Clark, 1986; McKernan, 1985; Burrow, 1987; Rodenstein, 1984; Conrad, 1986). However, no single method seemed to be outstanding; suggestions were made for developing a computer literacy component of an existing business education course and for teaching a free-standing computer literacy course.

Krause, et. al. (1986) examined the implications of providing computers to every teacher and indicated that readily available hands-on opportunities for teachers would result in different teaching strategies.

State-wide Efforts

There were few studies exploring the status of computer instruction in business education on a state-wide basis. Studies by Lantz, 1984; Lambrecht, 1986; and Seeber, 1984 reported the status of computer instruction in Ohio, Minnesota, and Kansas respectively. They found significant variations in the uses of computers and the amount of potential envisioned for their use.

The Louisiana State Department of Education, Office of Research and Development (1984) has prepared yearly surveys of computer uses in public and nonpublic schools. These studies, however, have not included computer uses in post-secondary schools.

Some states have mandated technological training for educational personnel and have provided the funding to backup the mandate. Under the Education Improvement Act of 1984, the governor's office in South Carolina committed $4.3 million to implement computer assisted instruction in high school mathematics and reading. Four years later, an elaborate instructional management system linking diagnostic tests to carefully designed teaching

modules existed throughout the state (Rumford, 1988). In 1984, the state of Michigan mandated that its teachers and administrators have access to training in classroom applications of computer technology and provided state funding to conduct workshops for hundreds of educators (1988).

As realization of the potential of computer instruction increases, more states are likely to appropriate funds needed to work toward achieving that potential.

CHAPTER II

METHODOLOGY AND PROCEDURES

The methodology of this study consisted of (a) developing, use-testing, and revising the questionnaire; (b) designing and conducting a survey; and (c) processing the survey data.

Instrumentation

A five-page questionnaire containing 50 questions was designed using both likert-scale and open-ended questions. The questionnaire was reviewed, use-tested and revised by the research consultant at The National Center for Research in Vocational Education at The Ohio State University and by personnel at Southern University at New Orleans. Questionnaires were coded by number to show which respondents were faculty members and which respondents were department heads. Since answers of department heads and faculty members were similar, separate comparisons were not made.

In the first part of the questionnaire, the respondents were asked to indicate general information such as academic background, academic rank, length of time in current position, type of institution, total enrollment of institution, enrollment in department, and year of first computer instruction. The second part of the questionnaire consisted of questions regarding the current status of computer instruction such as what types of hardware were being used, what types of software were being used, and what capabilities were desired in hardware and software. Finally, respondents were asked questions designed to solicit their forecasts for the future of

computer instruction. Even though assurances of anonymity were given, many of the respondents provided a name and address on the questionnaire and requested a copy of the completed study.

Population and Sample

The population for this study included all business education department heads and faculty at four-year state-supported colleges and universities in Louisiana. Therefore, the sample for this study included all such colleges listed in the Louisiana School Directory, Bulletin 1462 (1985). Names of faculty members were supplied by the Vocational Education Coordinating Unit of the Louisiana Department of Education. After the list of names was compiled, duplicate names were eliminated and the resulting list of 12 department heads and 44 faculty members constituted the actual sample size of 56. Only three people were not at the listed schools; consequently, it was concluded that the address list was up to date.

The participant package included a cover letter addressed to business education teachers, a copy of the questionnaire, and a stamped addressed envelope. A package was sent to each department head and to each faculty member with the assumption that whoever opened the envelope would give the questionnaire to the faculty member who was involved in computer instruction.

The initial mailing and a follow-up two weeks later combined with follow-up telephone calls two weeks after the second mailing yielded a total response of 56 questionnaires (79%).

Data Analysis

Several statistical techniques were employed in the analysis of the data. Descriptive statistics (means, standard deviations, ranges, and frequencies) were calculated for each item. T tests were computed in cases where significance was suspected. Likert-scaled responses for items 13-22 and 33-44 were coded 1 (no importance) to 4 (very important).

Schools were divided into two classifications based on enrollment figures: large (more than 10,000 students) and small (10,000 or fewer students). T-tests were calculated to determine if responses to the questions concerning computer literacy (Questionnaire items 13-32) differed for large schools versus small schools. No significant differences were found. A similar procedure was used to determine whether accreditation affected responses to Items 13-32, and again, no significant differences were found. NCATE was the accrediting agency for 31 of the 35 institution responses included in this section.

Although 56 questionnaires were returned, items do not always sum to the total questionnaires returned because some respondents omitted items. Five forms were not used because the format was not compatible with the other questionnaires. One person responded twice but was included only once. Consequently, thirty-five questionnaires were used in the data analysis.

Location of department and programs offered showed very little variability. Thirty of the institutions offered business education. Twenty-seven programs were located in the business school. Interestingly, there was little variability across all items for all school sizes, departments, and faculty classifications. Since no significant differences were found in faculty and department head responses, all data reported in the findings represent combined responses.

CHAPTER III

FINDINGS

The findings of the study are reported under three headings -- General Information, Purpose of the Study, and Factors Limiting Computer Usage.

General Information

General information was collected which would describe the professional characteristics of the participants and the participants' interpretation of computer literacy.

Thirty (90.9%) of the respondents had an academic background in business education; three had academic backgrounds in "other" areas; and two persons did not answer this item. Twenty-one (61.8%) persons earned the doctoral degree; thirteen (38.2%) earned the masters; and one did not respond to this item.

Eight (38.2%) of the respondents were associate professors; seven (21%) were full professors; six (18%) were assistant professors; and eight (24%) were instructors. The respondents had held their current positions for an average of 9.4 years.

All participating universities and colleges were classified as public institutions. Wide variation was reported for both school and department sizes. Student enrollments ranged from 4,000 to 25,000 with an average institution enrollment of 10,047. The range of department sizes by student enrollment was from 78 to 1,967. The average department size by student enrollment was 397. The majority (27 or 77.1%) of the departments was

located in the School of Business; whereas, only five (14.3%) were located in a School of Education, and three (8.6%) were located in other areas. Only eight respondents indicated that their programs were not in the School of Business.

Computer instruction was incorporated into courses after 1980 in 25 of the 35 departments. An increase in computer instruction appeared in the 1980s with the greatest number of changes appearing in 1985. One department provided computer instruction as early as 1974 and one started as late as 1988. The frequencies and dates are listed in Table 1:

Table 1: Dates Computer Instruction Initiated

Date	Frequency
1974	1
1975	1
1976	1
1978	2
1979	2
1980	4
1981	4
1982	3
1983	5
1984	2
1985	4
1986	2
1988	1
No response	3

Respondents indicated that there were 30 (86%) programs designated business education; 24 (69%) office administration programs; 11 (32%) office systems programs; and 1 (2.9%) accounting program. Nine (26%) answered that their courses were taught in some other departmental areas. They did not specify the area which included their courses.

Most of the participating schools were accredited. Eleven (31%) were accredited by the American Association of Collegiate School of Business (AACSB); 31 (87%) were accredited by the National Council for the Accreditation of Teacher Education (NCATE); and five (14%) were accredited by the Southern Association of Colleges and Schools (SACS). Two (6%) were accredited by other agencies, and only one (3%) was not accredited by any agency.

Analysis of the Data

A summary of the findings of this study is presented in relationship to each of the research questions. Each research question is stated and then discussed in terms of related findings of the study.

Research Question One

What are the dimensions of a working definition of computer literacy in business education?

Twenty-eight respondents wrote detailed definitions of computer literacy. All of the definitions seemed to fit two distinct categories: (1) detailed knowledge of computers and ability to use computers and (2) knowledge of capabilities of computers and the effect of computers on society. Of the 28 responses, 17 were described in the first category and the remaining 11 definitions fit into the second category. The definitions summarized from the data include the following:

Detailed knowledge of and ability to use computers

Ability to keyboard and use software programs: WP, spreadsheets, MS-DOS, graphics, database management, shared logic system, and some programming language.

Boot the computer and use at least one routine or language.

Knowledge of how to input data.

Ability to use computer systems to support management decisions.

Knowledge of capabilities of computers and their effect on society

Knowledge of terminology; knowledge of logic and general understanding of one programming language.

Understanding of what computers can do: use in education, business, and industry; use of software and understanding of languages.

Understanding a system of interconnected components which electronically process information according to instructions.

Understanding of computers and ability to apply that knowledge to the use of computers in office administration classes.

Knowledge of concepts and terminology.

Knowledge of how computers are used in the business world.

The respondents who reported that computer literacy included a detailed knowledge of computers and the ability to use computers seemed to agree with a summary definition reported by Lantz in which the basic dimensions of computer literacy were identified. Lantz also described extended dimensions of computer literacy which included such concepts as knowledge of ethical and legal computer use. However, none of the extended dimensions were indicated by respondents in this study.

Another consideration is the impact of media on computer literacy. Watching television and reading newspapers can result in a knowledge of computers and their capabilities. If this is the case, we can assume that some people who cannot read are computer literate. It is unlikely that this is the notion intended by researchers who support the definition of computer literacy as having a "knowledge of computers and their applications." Thus, it appears that the computer literate person must be able to use common programs, at least.

Business education department heads and faculty members perceived that at least some level of computer literacy was important to their graduates. Averages, ranges, standard deviations, and t values (Chase and Brown, 1986) showing the levels of importance of computer literacy to program graduates are reported in Table 2. Responses to the request to indicate the importance of ten items to the computer literacy of graduates were coded as follows: 1=no importance, 2=little importance, 3=some importance, 4=very important.

Table 2: Importance of Computer Literacy of Graduates

Item	Average	Range	Standard deviation	t value
13	3.63	2-4	.55	14.13
14	3.80	3-4	.41	21.67
15	3.63	2-4	.60	14.13
16	3.69	2-4	.53	14.88
17	2.46	1-4	.78	.33
18	3.71	2-4	.57	13.44
19	3.26	1-4	.74	6.91
20	3.71	1-4	.67	12.10
21	3.39	1-4	.83	6.85
22	3.49	2-4	.56	12.38

t value must be equal to or greater than 1.65 to be significant.
N = 44. df = N - 1.

Participants were asked to indicate their opinions of the importance of (13) knowledge of the role of computers in society, (14) knowledge of computer limitations and capabilities, (15) knowledge of the use of the computer as a problem-solving tool, (16) keyboarding skills, (17) programming skills, (18) data entry and retrieval skills, (19) computation skills, (20) word processing skills, (21) computer instruction skills, and (22) knowledge of careers/job opportunities related to computers. The t value of .33 in Table 1 is less than 1.65 and, therefore, indicates no significant difference for Item #17, programming skills. Thus, the respondents feel that the ability to write computer programs is not an important skill to the graduates of programs represented in this study. On the other hand, all of the other listed items were important to the participants. Having a knowledge of computer limitations and capabilities seemed to be very important as indicated by the high t value of 21.67.

Research Question Two

What evidence is there that business education programs are modifying their curricular and instructional computer offerings to meet the needs of business and industry?

Adding or restructuring courses seemed to be the predominant means of incorporating computer instruction into business education curriculums. Twenty-four respondents reported that they had either added or restructured courses. Among the other changes, which are detailed in Table 3, were retraining staff, adding a department, deleting old technology, and charging a computer usage fee. It seems that the modification of curriculums and instructional computer offerings requires a substantial investment of time by administrators, who must encourage and

sanction the changes, and by faculty, who must provide the time and effort once the funds for hardware and software are provided. Faculty may need special encouragement to carry out complex innovations such as restructuring courses which require not only developing knowledge of the software and hardware, but also developing new ways of teaching.

Table 3: Computer Instruction Incorporation

Changes	Frequency
Added courses	13
Restructured courses	11
Purchased computers	7
Retrained staff	3
Added department	1
Deleted old technology	1
Charged computer usage fee	1

Research Question Three

What are the strengths and weaknesses of computer software used in post-secondary business education programs?

Participants were asked to rank strengths and weaknesses of computer software programs that they used in their classes. Since few actual rankings were included, responses are reported as "used" or "not used". Applications, tutorials, and drill/practice software packages were most often used as shown in Table 4. Simulations and games were used to a lesser extent.

Table 4: Type of Software Used

Software	No. Using	Percent Using
Applications	30	85.7
Drill/practice	23	65.7
Tutorial	21	60.0
Simulation	15	42.9
Games	11	31.4
Other	3	8.6

Wordperfect seems to be the software program that most respondents use as well as prefer. Displaywrite, Wordstar, Ability Plus, and DBase III were likewise among the most used, but not most preferred programs. Lack of familiarity with other programs could have contributed to the order of preferences. Although Table 5 does not include a listing of all possible options, it does include all choices ranked by respondents. The table also shows the rankings from the most often used to the least often used software. In responding to the question of which software was best liked (1) and which was least liked (3), participants reported that all of the software was used by at least three respondents.

Table 5: Most Used and Most Preferred Software

Software	No. Using	Ranking
DBASE III	13	(Not ranked as #1 by anyone)
Wordperfect	11	(Ranked #1 by 7)
LOTUS 123	11	(Ranked #1 by 3)
Displaywrite	5	(Ranked #1 by 4 of the 5)
Wordstar	5	(Ranked #1 by 2)
Ability Plus (Integrated pkg.)	5	(Ranked #1 by 2)
Smart	4	
Lanier	4	
First Choice	4	
PC Write	3	

IBM and Zenith are the hardware brands most used by respondents. Table 6 shows the numbers of those reporting how they use the particular hardware--from hardware used most, to hardware used least. Rankings show which brands were the number one choices. All of the hardware was used by at least two respondents.

Table 6: Most Used and Most Preferred Hardware

Hardware	No. Using	Ranking
IBM PC	19	(Ranked #1 by 14 of the 19)
Zenith	12	(Ranked #1 by 5)
IBM XT	5	
IBM clones*	5	
Lanier	5	
Apple IIE	4	
Tandy 1200	4	
Tandy 2000	3	
Digital	3	
DED	2	
Leading Edge	2	
Decmate	2	

*IBM clones includes other unspecified brands.

Research Question Four

To what extent are computer vendors used as resources in business education computer instruction and in curriculum development?

Vendors seemed to provide more services than advisory committees. In 23 (66%) of the cases vendors supplied equipment and material, and in 14 (40%) of the cases vendors serviced computers. Vendors were used for in-service training in 6 (17%) of the cases and for placement and follow-up in 2 (6%) of the reported cases. Vendors need to get from a

selling mode and into an educational mode observed Lantz (1984). Educators need to learn what software and hardware can do before they can respond adequately to vendors' questions about what educators want computers to do.

Research Question Five

What provisions are made for retraining and updating staff in the business education programs including representatives from business, industry, labor, and the computer industry?

Participants were asked to report provisions made by their institutions for updating and retraining staff. Workshops (24 of 34 = 70.6%), individual instruction (25 of 34 = 73.5%), and extra coursework (12 of 34 = 35.3%) were used for retraining efforts. Lantz (1984) reported that representatives from business, industry, and the computer industry are used to some extent in training and updating school staff and in training or retraining vocational graduates after employment.

Representatives from business, industry, labor, and the computer industry were considered advisory committees, and these committees seemed to serve very few functions. Only seven (20%) respondents reported that advisory committees functioned as a part of their departments, and few services were provided by the existing ones. Program improvement (6=17.1%), placement and follow-up of graduates (3=8.6%), and in-kind contributions (1=2.9%) were the major services supplied by advisory committees.

Research Question Six

What evidence is there that graduates of programs utilizing computer instruction are obtaining employment based on computer training?

Twenty-three (69.7%) of 31 respondents to this item had evidence that graduates obtain employment based on computer skills. Twenty (64.5%) of the 31 reported conducting follow-up studies. It is likely that the evidence regarding employment is based on follow-up reports.

Most administrators indicate that they are not receiving a strong demand by employers for students to have computer literacy skills to ensure employment according to Lantz (1984). A comparison of the 1984 Lantz study results with the present 1988 study results indicates a trend toward computer training requirements in employment.

Research Question Seven

To what extent do business education students receive certificates for completing work with computers, apart from diplomas? Are there problems with issuing such certificates?

Certificates for computer training seemed to have little importance even though training affected employment opportunities. Only three programs offered certificates for computer literacy; and only one felt that certificates should be offered.

Schools were almost equally divided between those that issue certificates to students for completing work in computers apart from the diploma and those that do not issue such certificates in Lantz's 1984 study. Schools that issue or plan to issue some form of recognition for computer literacy training or more advanced training are using or plan to use the following vehicles:

a. The Ohio Department of Education vocational certificate by completing the open-ended area on the back of the certificate, specifying the training received.

b. A special certificate including performance based on competency levels.

c. A notation on the student's transcript.

d. An Adult Data Processing Evaluation Sheet with such information as keystrokes per hour with percent of error rate, BASIC and COBOL programming activities, ability to perform flowcharting and to use peripherals, et cetera.

Research Question Eight

What recommendations do educators make for the future uses of computers in business education?

Averages, ranges, standard deviations, and t values showing the degree of importance to the future of computer instruction in courses taught by participants are reported in Table 7. Responses to the request to check the importance of ten items about the future of computer instruction were coded as follows: 1=no importance, 2=little importance, 3=some importance, 4=very important.

Administrative support of computer instruction (33), staff responsibility for integrating computer instruction into courses (34), needs assessment to determine potential jobs for computer literate graduates (35), development of a long-range program plan (37), individual/group in charge of implementing computer instruction (38), staff development opportunities including "hands on" (39), certificates

Table 7: Projected Importance of Computer Instruction to Courses

Item	Average	Range	Standard deviation	t values
33	3.94	3-4	.24	36.00
34	3.20	3-4	.38	11.67
35	3.83	1-4	.90	9.50
36	2.55	1-4	.97	.33
37	3.62	2-4	.60	12.44
38	3.32	1-4	.81	6.83
39	3.71	2-4	.52	15.13
40	2.23	1-4	1.00	1.80
41	2.91	1-4	.82	3.42
42	3.35	1-4	.77	7.08
43	3.60	2-4	.69	11.00
44	3.26	2-4	.70	6.01

t value must be equal to or greater than 1.65 to be significant.
N = 44. df = N - 1.

issued to staff trained in computer instruction (40), linkages with other organizations advocating computer instruction (41), evaluation of the computer instruction program (42), access to software for evaluation purposes (43), and integration of management information system (MIS) (44) were all seen as being important to the future of computer instruction. The low t value of "advisory board involvement (36)" indicates that it was viewed as not being important.

Whereas advisory board involvement seemed to have little significance, five other items showed significantly high t values. There seemed to be general agreement that administrative support of computer instruction (33) had very great importance. Very important, but not as important as administrative support were staff development opportunities including "hands on" (39), development of a long-range plan (37), staff responsibility for integrating computer instruction into courses (34), and access to software for evaluation purposes (43). Generally,

administrative support was most important and staff development opportunities was next in line of importance.

The following are factors, based on the study, that vocational educators felt should be considered in planning staff development in computer instruction:

Category 1

More application software seminars

More money for software, supplies, and maintenance

More individual "hands-on" opportunities

More CRTs, printers, other peripherals

More IBM/IBM compatible hardware, more space for computers

Methodically prepared instructional material, tests (theory and applications)

Category 2

One-hour course in Lotus 1-2-3; workshop/continuing education on DOS commands

All work to be done on computers

More hands-on experience for students

Need accounting programs

Apply computer instruction to Introduction to Business courses; more problems in current computer application course

Arrangements with major software vendors to provide software to educational institutions at a reasonable cost

Need weekend lab hours for students

Need computer use in business communications

The items in Category 1 seem to indicate resources to be considered in planning staff development in computer instruction. Category 2 items seem to refer to student development. However, respondents may foresee the added pressure to update coming from students as well as from administrators.

The most popular new hardware brand desired for the future by respondents was IBM. MacIntosh and Zenith ranked a distant second in popularity. Tandy and Apple IIe were also mentioned.

Participants were asked to suggest additional capabilities they would like for classroom software to have in the future. Mainly, the suggestions corresponded to the needs listed for the improvement of computer instruction. The following items summarize the suggested improvements:

1. Develop more user friendly software. Software should be menu driven so that the need for documentation is lessened.
2. Improve software packages of project management, statistical analysis, tutorials in accounting, and simulations for the stock market.
3. Enhance communication packages with better graphics.
4. Increase the capabilities of word processing software and DBase III.

No general trend appeared in the types of capabilities recommended for software required in the near future; however, respondents indicated that more software should be made available. Software packages that participants want to have on hand in their departments included:

Wordperfect, Lotus 1-2-3, Displaywrite, PFS Write, First Choice, Turbo C, Pagemaker, DBase III, and Wordstar. Table 8 displays the software acquisitions recommended and the frequencies of the responses. No indication was made regarding whether software should be compatible with a mainframe.

Table 8: Recommended Software Acquisitions

Software	Frequency
Wordperfect	4
Lotus 1-2-3	3
Displaywrite	3
PFS Write	1
First Choice	1
Turbo C	1
Pagemaker	1
DBase III	1
Wordstar	1

Both department heads and faculty members indicated that they would like to see changes relative to computer instruction. Their suggestions included the following:

Develop more computer applications and methodologies of instruction.

Require business education graduates to know how to use computers and apply software to business problems.

Provide more supervised laboratory hours.

Supply incentives for teacher retraining.

Require business education faculty to teach computer literacy courses. (Management faculty should not teach computer literacy.)

Offer computer literacy certification for word processing courses.

Use the computer in all business classes.

Ensure knowledgeable laboratory assistants.

Get the high schools to catch up to colleges in computer instruction. (We are being sent students with stone age writing skills, but we expect them to function on space age equipment.)

Require a keyboarding class for all students regardless of major.

Factors Limiting Computer Usage

Factors limiting computer usage were varied. The newness of computer instruction, the lack of awareness of available software, and the need for new equipment were some factors which limited computer use in reporting institutions. One-half of the respondents said computer instruction was incorporated within the last five years, and twenty-seven respondents reported that they need new computers. Additionally, when asked for suggestions for the improvement of computer instruction, most respondents revealed that they needed additional opportunities for hands-on experiences.

CHAPTER IV

SUMMARY

In this section, a summary of the findings of this study are presented and discussed in relationship to each of the research questions. Finally, the conclusions of the study are presented followed by recommendations for business education and for further research.

Results Related to Research Questions

Each research question is stated and then discussed in terms of related findings of the study.

Research Question One

What are the dimensions of a working definition of computer literacy in business education?

To answer Research Question One, participants were asked to define computer literacy. The responses revealed that educators' perception of the dimensions of computer literacy were divided. A difference showed up in opinions regarding whether computer literacy simply included a knowledge of computers and their capabilities or whether a person should be able to use a computer. One dimension included knowing the capabilities of computers and understanding their effect on society. To be computer literate under this definition, knowledge of things such as concepts, terminology, programming language, components, and applications would be required. This definition excludes the ability to apply knowledge of computers.

A second version of computer literacy reported by participants included a detailed knowledge of and the ability to use computers. This definition extended to having the ability to use software programs such as word processing, spreadsheets, MS-DOS, graphics, database management, and shared logic systems. Further, the definition included having a knowledge of some programming language and having the ability to use computer systems to support management decisions. Support for this definition came in varying forms by several authors.

After defining computer literacy, respondents were asked to indicate the importance of ten items to the computer literacy of business education graduates. All of the items were rated important with the exception of programming skills. When provided a list of computer skills, respondents indicated that items such as keyboarding skills, data entry and retrieval skills, computation skills, and word processing skills were important to the computer literacy of business education graduates; however, when asked to write a definition of computer literacy respondents indicated that it included having a knowledge of computers and their role in society. Definitions taken from the literature agree that some computer skills are necessary to be computer literate.

If being computer literate means being able to use common programs such as word processing, spreadsheets, and database management then some considerations become apparent. First, faculty members must become computer literate if they are to teach with this new technology. Department heads and faculty members in the study indicated that they needed more hands-on training, more equipment, more instructional materials, and more availability of equipment among other things. This type of response seems understandable in view of the fact that the

integration of computer instruction into the business curriculum in Louisiana did not become prominent until 1980, and nearly half the participants began computer instruction after 1985. Consequently, faculty and students involved in developing programs may have some limitations and many needs.

Research Question Two

What evidence is there that business education programs are modifying their curricular and instructional computer offerings to meet the needs of business and industry?

Adding or restructuring courses seemed to be the predominant means of incorporating computer instruction into business education curriculums. Twenty-four of the 44 respondents reported that they had either added or restructured courses. Among the other changes were retraining staff, adding a department, deleting old technology, and charging a computer usage fee. Since many of the respondents reported that they began computer instruction after 1985, it can be assumed that more will be done in the future.

Research Question Three

What are the strengths and weaknesses of computer software used in post-secondary business education programs?

To answer Research Question Three, participants were asked to rank types of computer software programs that they used in their classes. Since few actual rankings were included, responses are reported as "used" or "not used". Applications, tutorials, and drill/practice software packages were most often used. Simulations and games were used to a lesser extent.

Wordperfect seemed to be the software program that most respondents use as well as prefer. Displaywrite, Wordstar, Ability Plus, and DBase III were likewise among the most preferred programs. It is likely that respondents were not acquainted with a wide range of software since many indicated that they needed more "hands-on" training and more staff development programs using computers.

Research Question Four

To what extent are computer vendors used as resources in business education computer instruction and in curriculum development?

Vendors seemed to provide more services than advisory committees. In most of the cases vendors supplied equipment and materials, and in a few of the cases vendors serviced computers. Vendors were used only nominally for computer instruction, placement, and follow-up. There were no reported cases of vendor use in curriculum development.

Research Question Five

What provisions are made for retraining and updating staff in business education programs including representatives from business, industry, labor, and the computer industry?

Few respondents reported that advisory committees functioned as a part of their departments, and few services were provided by those in existence. Program improvement, placement and follow-up of graduates, and in-kind contributions were the major services supplied by advisory committees.

Research Question Six

What evidence is there that graduates of programs utilizing computer instruction are obtaining employment based on computer training?

To answer the question, respondents were asked if they conduct follow-up studies of their graduates and to indicate evidence that graduates obtain employment based on their computer skills. Most of the respondents had evidence that graduates obtain employment based on computer skills, and most of the respondents reported conducting follow-up studies.

Research Question Seven

To what extent do business education students receive certificates for completing work with computers apart from diplomas? Are there problems with issuing such certificates?

Certificates for computer training seemed to have little importance even though training affected employment opportunities. Only three programs offered certificates for computer literacy; and only one of the three felt that certificates should be offered.

Research Question Eight

What recommendations do educators make for the future uses of computers in business education?

There seemed to be general agreement that administrative support of computer instruction had very great importance. Very important, but not as important as administrative support were staff development opportunities including "hands on", development of a long-range plan, staff responsibility for integrating computer instruction into courses,

and access to software for evaluation purposes. Respondents reported that administrative support was more important for the future of computer instruction than all other considerations. The lack of this support might have been a reason for the time lag in introducing computer instruction. Advisory boards were considered unimportant.

There were no general trends shown in the types of capabilities respondents would like to see in software or hardware, except that most of them wanted more of it and more time to use it.

The future of computer instruction may be envisioned with the help of the media. Through science fiction movies particularly, educators may become familiar with computer concepts such as artificial intelligence, telecommunications, audio/visual systems, and computer conferencing and visualize these features in educational settings. The promise for management tasks, courseware development, and for delivery must be considerable.

Nearly all respondents indicated that they needed more equipment and more software. Respondents stated that each teacher should have a computer in his or her office. However, resources without faculty development would be of little value. Assuming that faculty members overcome their fear of computers in the privacy of their offices and take the time to work through documentation and software, this situation seems ideal. However, in Louisiana at least, the state of the economy seems to prevent this kind of expenditure at public universities.

On the other hand, the present state administration has bolstered education as a major priority and may consider some of the concepts of The National Task Force on Educational Technology. The Task Force believes that education can be made more cost-effective and its quality enhanced

through technology-based education. Technology should enable educators to buy more learning per dollar and thus expand its benefits to society. Overall costs may be higher in the short term. But the costs of acquiring, maintaining, and replacing technology will have to be met if education is to serve the growing needs of an increasingly technical society.

The Task Force recommended that by 1990 schools gear up to improve traditional delivery to the maximum. Schools need to acquire hardware and software and apply them effectively. One work station for every ten students is an achievable goal according to the Task Force report. Teachers, then, will need individual work stations for the purpose of developing teaching proficiency. This acquisition process should include planning which integrates areas such as finances, teacher education, curriculum and instruction, and evaluation.

Finally, a goal of one work station per teacher and one work station for every ten students will require advocacy by both administrators, faculty, and staff.

Conclusions

The following is a summary of conclusions based on the findings of this study:

1. To be computer literate, one must have a knowledge of computer terminology and concepts and have the ability to use computer programs.

2. Adding or restructuring courses seemed to be the predominant means of incorporating computer instruction into business education

curriculums. Among the other changes were retraining staff, adding a department, deleting old technology, and charging a computer usage fee.

3. Applications, tutorials, and drill/practice software packages were most often used. Simulations and games were used to a lesser extent. Wordperfect was the software program that most respondents use as well as prefer.

4. Vendors supplied equipment, materials, and serviced computers. Vendors were used only nominally for computer instruction, placement, and follow-up. There were no reported cases of vendor use in curriculum development.

5. Advisory committees served very few functions. Program improvement, placement and follow-up of graduates, and in-kind contributions were the services supplied by a few advisory committees.

6. Respondents had evidence that graduates obtain employment based on computer skills, and most respondents conduct follow-up studies.

7. Certificates for computer training seemed to have little importance even though training affected employment opportunities.

8. Administrative support of computer instruction is very important. Also important were staff development opportunities including "hands on", development of a long-range plan, staff responsibility for integrating computer instruction into courses, and access to software for evaluation purposes.

Recommendations

The following are recommendations for computer instruction that are based on the findings and conclusions of the present study:

1. School administrators should encourage faculty to support curricular changes designed to develop computer literacy among all business education faculty and students. For faculty, this support may include providing funds for taking computer courses, workshops, seminars, or reduced course loads for the purpose of increasing computer literacy. For students, this support may include requiring formal courses in computer applications or integration of this content into existing business education courses.

2. A system should be developed which will allow educators to evaluate the instructional and management capabilities of the myriad of software with a view toward establishing an integrated system.

3. Faculty members should be provided with ample opportunities to gain computer literacy in a nonthreatening environment, such as their office, prior to the implementation of a computer component in the curriculum. These faculty members should be provided with individual training on computers designed to develop mastery before they are required to train students.

4. Simulations of computer instruction in business education courses should be solicited from vendors and advisory committees for use in training faculty about computer applications in the curriculum. Where possible, arrangements should be made with local businesses to utilize their information systems so that teachers may see computer uses in real situations and, thereby, develop a broad knowledge of computer uses.

5. Advisory committees should be composed of individuals who will be capable of advising relative to policy decisions, offering placement opportunities for graduates, and providing funding support.

6. Administrators should encourage proposal writing, solicitations from businesses, and other efforts among faculty which will result in the acquisition of current hardware and software.

The following are recommendations for future research that are based on the findings and conclusions of the study:

1. An instrument needs to be developed which will measure the number of computers available to teachers, the amount of software on hand, and the number of computers available to students in Louisiana colleges and universities.

2. This study should be replicated utilizing business education courses in other states to determine the status of computer instruction on a national level.

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APPENDICES

SOUTHERN UNIVERSITY AT NEW ORLEANS
6400 Press Drive
New Orleans, LA 70126
(504) 282-4401, Ext. 301

EPARTMENT OF OFFICE MANAGEMENT AND
SECRETARIAL SCIENCES

March 16, 1988

Dear Colleague:

Would you like to know what is going on in Louisiana higher education regarding computer instruction in business education? If so, please take time to complete and return the enclosed questionnaire by March 30, 1988.

Here is an opportunity for you to contribute to a study to acquire information that is currently not available about the status of business education computer instruction in this state. The resulting information will be shared with you when it is available.

All information will be kept completely confidential, so please answer as accurately as possible. Your contribution to this study certainly will be appreciated.

If you have questions or concerns, please feel free to call me at (504) 282-4401, Ext. 301.

Very sincerely yours,

Lillian W. Clarke, Ed.D.
Department Head

tba
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AN EQUAL OPPORTUNITY EMPLOYER

SOUTHERN UNIVERSITY AT NEW ORLEANS
6400 Press Drive
New Orleans, LA 70126
(504) 282-4401, Ext. 301

DEPARTMENT OF OFFICE MANAGEMENT AND
SECRETARIAL SCIENCES

March 30, 1988

Dear Colleague:

Would you like to know what is going on in Louisiana higher education regarding computer instruction in business education? If so, please take time to complete and return the enclosed questionnaire by April 13, 1988.

Here is an opportunity for you to contribute to a study to acquire information that is currently not available about the status of business education computer instruction in this state. The resulting information will be shared with you when it is available.

All information will be kept completely confidential, so please answer as accurately as possible. Your contribution to this study certainly will be appreciated.

If you did not return the questionnaire that was sent previously, would y ou please complete and return the one that is enclosed. Please feel free to call me at at (504) 282-4401, Ext. 301, if you need any further information.

Very sincerely yours,

Lillian W. Clarke, Ed.D.
Department Head

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AN EQUAL OPPORTUNITY EMPLOYER

All information will remain confidential.
Only group data will be reported.

COMPUTER INSTRUCTION IN BUSINESS EDUCATION SURVEY

Please provide information on computer instruction in your institution. This information will assist in improving computer instruction in business education programs in Louisiana.

Return the completed form in the self-addressed envelope or mail it to Dr. Lillian Wilson Clarke, Department of Office Management and Secretarial Sciences, Southern University at New Orleans, 6400 Press Drive, New Orleans, Louisiana 70126, by March 30, 1988.

Part I. General Information

1. Which of the following categories describes your academic background?

Major area(s) of study	Highest degree
_____ Business Education	_____ Associate
_____ Office Systems	_____ Bachelors
_____ Office Administration	_____ Masters
_____ Other _____ (Specify)	_____ Doctorate

2. What is your academic rank? _____

3. How long have you been in your current position? _____ (Years)

4. Of what type is your college/university? _____Private _____Public

5. What is the total enrollment at your institution? _____

6. What is the enrollment in your department? _____

7. In what school/college is your department located?
_____ Business _____ Other (specify) _____
_____ Education

8. Which of the following programs does your institution offer?

Program	Department name
_____ Business education	_____
_____ Office administration	_____
_____ Office systems	_____
_____ Other _____	_____

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9. What agencies accredit your business education program(s)?
   _____ American Assembly of Collegiate Schools of Business (AACSB)
   _____ National Council for the Accreditation of Teacher Education (NCATE)
   _____ Not accredited
   _____ Other _____
   (Specify)

10. When did your institution start to incorporate computer instruction into business education programs? _____
    (year)

11. What changes were made to incorporate computer instruction?

    _____

12. What is your definition of computer literacy in business education?

    _____

    _____

Directions: Check the level of importance of each of the following items to the computer literacy of business education graduates.

	No importance	Little importance	Some importance	Very important
13. Knowledge of the roles of computers in society (e.g., economical)	_____	_____	_____	_____
14. Knowledge of computer limitations and capabilities	_____	_____	_____	_____
15. Keyboarding skills	_____	_____	_____	_____
16. Knowledge of the use of the computer as a problem-solving tool	_____	_____	_____	_____
17. Programming skills	_____	_____	_____	_____
18. Data entry and retrieval skills	_____	_____	_____	_____
19. Computation skills	_____	_____	_____	_____
20. Word processing skills	_____	_____	_____	_____
21. Computer instruction skills	_____	_____	_____	_____

22. Knowledge of careers/job opportunities related to computers _____ _____ _____ _____

Part II. Current Status of Computer Instruction

23. What types of computer software do you use? Rank in order, 1 most used to 5 least used.
_____ Tutorial _____ Drill/practice _____ Application
_____ Simulation _____ Games _____ Other _____
(Specify)

24. Which software programs do you use most? List from the best liked (1) to the least liked (3).

	Brand (e.g., Lotus)	Type (e.g., spreadsheet)
1.	_____	_____
2.	_____	_____
3.	_____	_____

25. What hardware do you use? List from the best liked (1) to the least liked (3).

	Brand (e.g., IBM)	Models (e.g., XT)
1.	_____	_____
2.	_____	_____
3.	_____	_____

26. Does your department have advisory committee(s)?
_____ No
_____ Yes _____
(Segments of community represented)

27. How are advisory committees used?
_____ Program improvement _____ In-kind contributions
_____ In-service staff _____ Placement/followup of graduates
_____ Other _____
(Specify)

28. How are computer/software vendors used?
_____ Service computers _____ Supply equipment/material
_____ In-service staff _____ Placement/followup of graduates
_____ Other _____
(Specify)

29. Are business education graduates given certificates for completion of computer literacy programs?
_____ Yes
_____ No Do you feel they should be? _____ Yes _____ No

30. Do you have evidence that your graduates obtain employment based on their computer skills?

_____ No
_____ Yes _____
(Give examples)

31. Are follow-up studies of graduates conducted?

_____ No
_____ Yes _____
(Frequency)

32. What provisions are made by your institution to update/retrain staff for computer instruction?

_____ Workshops provided
_____ Extra coursework required
_____ Individualized instruction
_____ Other _____
(Specify)

Part III. Future Computer Instruction

Directions: Please check the degree of importance of each of the following items to the future of computer instruction in business education at your institution.

	No importance	Little importance	Some importance	Very important
33. Administrative support of computer instruction	_____	_____	_____	_____
34. Staff responsibility for integrating computer instruction into courses	_____	_____	_____	_____
35. Needs assessment to determine potential jobs for computer literate graduates	_____	_____	_____	_____
36. Advisory board involvement	_____	_____	_____	_____
37. Development of a long-range plan	_____	_____	_____	_____
38. Individual/group in charge of implementing computer instruction	_____	_____	_____	_____
39. Staff development, opportunities including "hands on"	_____	_____	_____	_____

40. Certificates issued to staff trained in computer instruction. ____ ____ ____ ____

41. Linkages with other organizations advocating computer instruction (e.g., universities/consortia) ____ ____ ____ ____

42. Evaluation of the computer instruction program ____ ____ ____ ____

43. Access to software for evaluation purposes ____ ____ ____ ____

44. Integration of management information system (MIS) ____ ____ ____ ____

45. What additional suggestions would you offer for the improvement of computer instruction at your institution? _____

_____

46. What additional capabilities would you like for classroom computers to have? _____

47. What new hardware would you recommend your department acquire in the near future?

Brand (e.g., Apple)	Model (e.g., MacIntosh)
_____	_____
_____	_____

48. What additional capabilities would you like for classroom software to have in the future? _____

_____

49. What software do you recommend your department acquire in the near future?

Brand name	Type (e.g., spreadsheet)
_____	_____
_____	_____

50. Other suggestions/comments you would like to provide relative to computer instruction in business education. _____

_____

THANK YOU FOR YOUR PARTICIPATION IN THIS SURVEY

RESEARCH QUESTIONS

Research Question One. What are the dimensions of a working definition of computer literacy in business education?

Research Question Two. What evidence is there that business education programs are modifying their curricular and instructional computer offerings to meet the needs of business and industry?

Research Question Three. What are the strengths and weaknesses of computer software used in post-secondary business education programs?

Research Question Four. To what extent are computer vendors used as resources in business education computer instruction and in curriculum development?

Research Question Five. What provisions are made for retraining and updating staff in the business education programs including representatives from business, industry, labor, and the computer industry?

Research Question Six. What evidence is there that graduates of programs utilizing computer instruction are obtaining employment based on computer training?

Research Question Seven. To what extent do business education students receive certificates for completing work with computers, apart from diplomas? Are there problems with issuing such certificates?

Research Question Eight. What recommendations do educators make for the future uses of computers in business education?